

REMARKS

Claims 1-4, 8, 9, 12-15 and 17 have been amended. Claims 6, 10 and 11 have been cancelled. Claims 1-4, 8, 9 and 12-17 remain for further consideration. No new matter has been added.

The objections and rejections shall be taken up in the order presented in the Official Action.

1. Claims 1-4, 6, 8-14 and 17 currently stand rejected for allegedly failing to particularly point out and distinctly claim the subject matter deemed to be the present invention.

Claims 1-4, 8, 9, 12-15 and 17 have been amended, and claims 6, 10 and 11 have cancelled.

2. Claims 1-4, 6, 8, 10 and 12-17 currently stand rejected for allegedly being anticipated by U.S. Patent 6,543,569 to Shimizu (hereinafter "Shimizu").

Claim 1

The Official Action cites three separate gear pairs (33 & 34; 133 & 134; and 112 & 113) of Shimizu for allegedly anticipating the claimed invention (see Official Action, pg. 3). We shall discuss each gear pair separately, and why Shimizu is incapable of anticipating the claimed invention

ELEMENTS 33 & 34 OF SHIMIZU

Shimizu discloses that element 33 is a first pinion, while element 34 is a first rack. Accordingly, elements 33 and 34 Shimizu form a cooperating rack and pinion arrangement. In

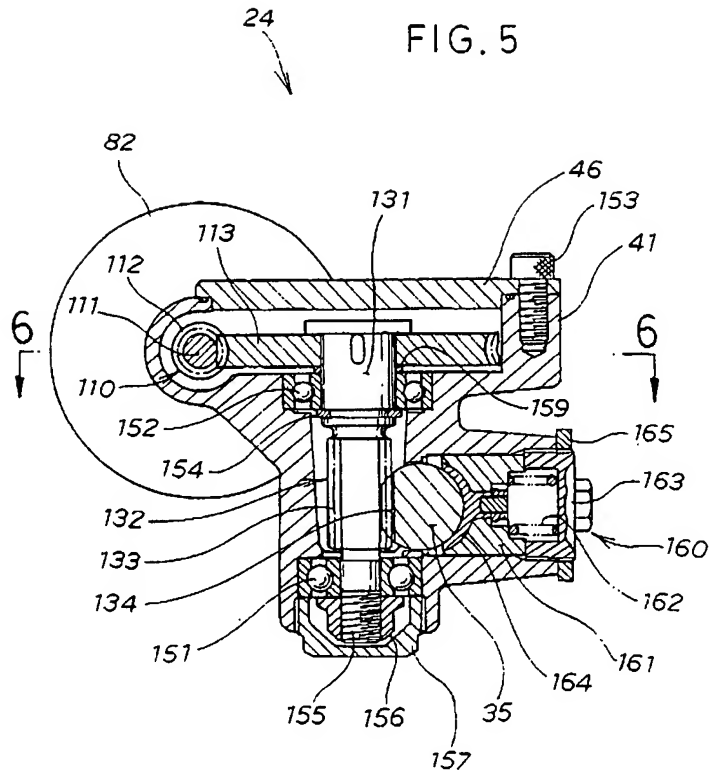
contrast, claim 1 recites a worm gear, not a rack and pinion arrangement. More specifically, claim 1 recites a worm and worm gear, which clearly can not read on the first pinion 33 and the first rack 34 of Shimizu.

ELEMENTS 133 & 134 OF SHIMIZU

Shimizu discloses that element 133 is a second pinion, while element 134 is a second rack. Accordingly, elements 133 and 134 form a cooperating rack and pinion arrangement. In contrast, claim 1 a worm gear, not a rack and pinion arrangement. Claim 1 recites a worm and worm gear, which clearly can not read on the second pinion 133 and the second rack 134 of Shimizu.

ELEMENTS 112 AND 113 OF SHIMIZU

Shimizu discloses that worm 112 cooperates with worm wheel 113. However, in contrast to the claimed invention Shimizu, clearly illustrates in FIG. 5 that the worm wheel is globodial, in contrast to the claimed cylindrical worm gear. FIG. 5 of Shimizu is reproduced below for convenience to illustrate the globoidal configuration of the worm wheel 113.



As discussed in the background section of the present application, globoidal gear arrangements provide contact over a **width dimension** of the tooth. In contrast, claim 1 recites that the linear contact provided by the cylindrical structure of claim 1 provides **linear contact occurs over the height dimension taken across at least three tooth pairs.** Claim 1 recites that the height dimension is perpendicular to the axis of rotation of the worm, and also perpendicular to the axis of rotation of the worm gear. Accordingly, for at least any one of these reasons, Shimizu is incapable of anticipating amended claim 1.

As a result, it is respectfully submitted that the anticipation rejection of amended claim 1 is moot and should be removed, and that amended claim 1 is in condition for allowance.

Claim 15

Claim 15 recites a worm gear assembly. Each tooth of the worm and each tooth of the worm gear has a concave profile in a region near a base of the tooth and a convex profile in a region near a tip of the tooth. Notably, claim 15 recites:

“where when the worm and worm gear rotate with respect to each other a portion of the concave and convex regions of one of the worm teeth mesh with a portion of the convex and concave regions, respectively, of the worm gear teeth, such that linear contact occurs over a height dimension taken across at least three worm teeth and worm gear teeth pairs at substantially separate piecemeal height regions along surface faces of the at least three tooth pairs so the separate piecemeal regions together establish the linear contact along the height dimension, where the height dimension is substantially perpendicular to both the first axis and the second axis.”(emphasis added, cl. 15).

Shimizu neither discloses nor suggests such an arrangement. As set forth above with respect to claim 1, the claimed worm gear can not read on the rack and pinion assemblies 33 & 34, and 133 & 134 of Shimizu. That is, the rack and pinion assemblies 33 & 34, 133 & 134 and their associated teaching in Shimizu are incapable of anticipating the worm gear assembly of claim 15.

The gear assembly 112 & 113 of Shimizu is also incapable of anticipating the subject matter recited in claim 15. Significantly, claim 15 recites that the linear contact occurs over a height dimension taken across at least three worm teeth and worm gear teeth pairs at substantially separate piecemeal height regions along surface faces of the at least three tooth pairs. The separate piecemeal regions together establish the linear contact along the height dimension, where the height dimension is substantially perpendicular to both the first axis and the second axis. That is, when the height of the individual contact regions along the at least three teeth pairs

is summed, the summed amount represents the height of the teeth, thus providing the linear height contact when viewing the summed height contact contribution from each of the at least three teeth pairs.

In contrast, although FIG. 8D relates to a pack and pinion structure rather than a worm gear structure as claimed, overlooking that substantial difference for moment, the claimed invention is still patentable over Shimizu since FIG. 8D of Shimizu merely discloses that the gear teeth contact each another about pitch line P_i (i.e., at the same place). In contrast, the system of claim 15 recites that *“linear contact occurs over a height dimension taken across at least three worm teeth and worm gear teeth pairs at substantially separate piecemeal height regions along surface faces of the at least three tooth pairs so the separate piecemeal regions together establish the linear contact along the height dimension, where the height dimension is substantially perpendicular to both the first axis and the second axis.”* (emphasis added). Shimizu neither discloses nor even suggests such a worm gear tooth contact arrangement, where separate piecemeal regions together establish the linear contact along the height dimension. Accordingly, it is respectfully submitted that Shimizu is incapable of anticipating the subject matter of claim 15.

Claim 17

Since claim 17 currently stands rejected for the same reasons as claims 1 and 15, and since claim 17 has been amended similarly to amended claim 15, the arguments above with respect to the patentability of amended claim 15 apply to amended claim 17. As a result, it is respectfully submitted that the anticipation rejection of amended claim 17 is moot and should be removed, and that amended claim 17 is in condition for allowance.

3. Claim 9 currently stands rejected for allegedly being obvious in view of the combined subject matter disclosed in Shimizu and U.S. Patent 2,760,381 to Pickles (hereinafter "Pickles").

It is respectfully submitted that this rejection is now moot since claim 1 is patentable for at least the reasons set forth above.

4. Claim 11 currently stands rejected for allegedly being obvious in view of the combined subject matter disclosed in Shimizu, Pickles and U.S. Patent 2,279,414 to Scott (hereinafter "Scott").

It is respectfully submitted that this rejection is now moot since claim 1 is patentable for at least the reasons set forth above.

For all the foregoing reasons, reconsideration and allowance of claims 1-4, 8, 9 and 12-17 is respectfully requested.

If a telephone interview could assist in the prosecution of this application, please call the undersigned attorney.

Respectfully submitted,

A handwritten signature in cursive script, reading "Patrick O'Shea", is written over a horizontal line.

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